

---

# Preliminary Science Flight Report

## Operation IceBridge Antarctica 2011



**Flight:** GV-FL01  
**Mission:** LVIS-Thwaites01

---

### Flight Report Summary

<b>Aircraft</b>	<b>NSF G-V (N677F)</b>
<b>Flight Number</b>	1
<b>Flight Request</b>	118003
<b>Date</b>	Friday, October 7, 2011, Day of Year 280
<b>Purpose of Flight</b>	Operation IceBridge Mission LVIS Thwaites 01
<b>Take off time</b>	8:58 local time from Punta Arenas (SCCI)
<b>Landing time</b>	6:40 local time at Punta Arenas (SCCI) on October 7, 2011
<b>Flight Hours</b>	10.7
<b>Aircraft Status</b>	Airworthy.
<b>Sensor Status</b>	All installed sensors operational except camera system.
<b>Significant Issues</b>	None
<b>Accomplishments</b>	<ul style="list-style-type: none"><li>• High-altitude survey (44,000 ft pressure altitude) of grid lines and ICESat track #71</li><li>• Completed mission as planned.</li><li>• Conducted roll and pitch maneuvers for LVIS calibration at beginning and end of flight</li></ul>
<b>Geographic Keywords</b>	Antarctica, Thwaites, West Antarctic Ice Sheet, WAIS
<b>ICESat/CryoSat Track</b>	Yes, ICESat Track #71
<b>Repeat Mission</b>	Overlap with previous IceBridge data over Thwaites area

## Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 GB	None
POS/AV (510 + 610)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5 GB	None
LVIScameras(2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	Power problem caused failure at beginning of survey
G-V Onboard Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 MB	None

### Mission Report (Michelle Hofton, Mission Scientist, Instrument Operators: David Rabine, Shane Wake)

The first IceBridge Mission of 2011 was the NSF/NCAR G-V aircraft carrying the LVIS laser altimeter and a dual camera system. One of the goals of the mission was to evaluate the performance of the aircraft in the Antarctic conditions. The science goal was to collect elevation data over grid lines on the Thwaites glacier. The overall deployment plan is to collect grid data over a large region that encompasses the entire Antarctic Peninsula to the Getz Coast.

Weather forecasts predicted cloud cover over the majority of the Peninsula and Pine Island Glacier, so the decision was made to go to Thwaites Glacier where a pocket of clear weather was expected.

The plane took off slightly ahead of schedule and climbed quickly, and then step-climbed up to 44,000 ft during the transit to the Thwaites area. Cloud cover during the transit prevented the collection of data over sea ice. No sea ice data was collected. Weather over the survey area was clear, exactly as predicted.

The LVIS sensor worked very well. Data was successfully collected over 100% of the survey lines.

The camera system lost power shortly after arriving at survey area. Attempts to resolve problem in-flight were unsuccessful. Further debugging will occur prior to next flight.

During the survey, the aircraft experienced very low temperatures in flight (-76C) and the fuel temperature was approaching minimum allowed values, so the decision to lower the altitude from 44,000 ft to 42,000 ft was made to increase the temperature. The airspeed of the plane was also increased to warm the wings and fuel. This technique was successful and allowed the survey to continue without issue.

A ramp pass was flown upon return to Punta Arenas at 10,000 ft for calibration of the LVIS absolute elevations.

### Individual instrument reports from experimenters on board the aircraft:

**LVIS:** The LVIS system worked well.

**POS/AV:** Systems worked well. No issues.

**LVIScam:** Both cameras stopped working at the beginning of the survey. A power problem is suspected.

**G-V on board data:** System worked well.

NSF/NCAR G-V (Gulfstream 5) aircraft with LVIS sensor onboard on the Punta Arenas airport ramp.  
(Photo credit: Michelle Hofton)



